Jerry Zhu

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Education

Stony Brook University Stony Brook, NY
Bachelor of Science, Computer Science *August 2022 - May 2026*

- **Cumulative GPA**: 3.54
- **Coursework**: Discrete Mathematics, Linear Algebra, Data Structures and Algorithms, Probability and Statistics
- **Extracurriculars**: Stony Brook Game Developers, Stony Brook Computing Society

Technical Skills

Languages: C++, C, C#, GLSL, Common Lisp, Scheme, Java, Python, Lua, JavaScript, TypeScript
Libraries & Technologies: SDL2, Win32 API, OpenGL & WebGL, Unity, Godot, MonoGame, Emscripten
Developer Tools: Git, Mercurial, Visual Studio, Visual Studio Code, GDB, Valgrind, RenderDoc, Bash, Trello, Linux

Projects

CrankLang | *C++* March 2023 - May 2023

- Designed a statically typed language supporting user-defined structures, enumerations, and multiple file modules with a handwritten recursive descent parser and compiler in C++
- Compiles programs from a type-checked and statically analyzed abstract syntax tree (AST) into C++ code
- Added a constant-folding optimization pass by preprocessing and substituting parts of the AST if any sub-expression was considered constant

Legends - RPG | *C, SDL2, Emscripten* June 2022 - Present

- Eliminated runtime memory allocations with a double ended stack allocator divided into permenant allocations and level allocations backed by a fixed 16MB buffer
- Developed a tiled software renderer with a multithreaded job system and SSE improving performance by 200%
- Designed a save system with delta compression reducing the memory usage of the system and save-file size by omitting redundant or static data
- Designed a Lisp-based scripting language with a custom parser to facilitate the development of game data such as items, dialogue, cutscenes, and entity data

Ascension - Action Platformer Prototype | *C, SDL2* February 2022 - March 2022

- Implemented a custom platformer physics engine with support for slopes and fixed timestep updates to allow for more deterministic and stable simulation behavior
- Developed a particle system with physical interactions with a spatial partitioning scheme to reduce the set of collisions for participating particles
- Designed an in-game level editor with support for live level playtesting allowing for iterative level design

2D Game Framework | *C, OpenGL, SDL2, Emscripten* July 2021 - October 2021

- Coded a plugin system to allow game code to be swapped without recompiling the framework
- Implemented a sprite batcher with a packed 16-bit integer vertex format reducing data size per sprite resulting in lower memory usage, and screen sprite culling
- Built a configurable glyph cache supporting arbitrary text with a fixed memory footprint. The cache is a hashset which invalidates and regenerates the cache if there are hash collisions

Leadership

Software Development Team Lead February 2021 - September 2022
The Environment Project *Queens, NY*

- Led the development of Recyclopedia, a wiki web application with a team of 4 using React, MongoDB, and Typescript
- Maintained and redesigned the organization's WordPress website which reached 10K visitors
- Authored the event page for the Flushing Meadows Corona Park clean-up which resulted in 111 participants
- Managed collaboration through GitHub pull requests, Trello, and pair-programming meetings on Zoom